in a passive way. Massage increases the circulation in the affected region, new tissue formation is favored, and the veins and lymphatics are rendered more patent, so that the extravasated fluid is pressed by the manipulations directly into these and so carried away. Compression aids these results by increasing the *vis a tergo* in the time between the use of massage and so serves to increase absorption.

Hand in hand with these manipulations active and passive motion should be used, which should vary in extent from time to time and thus, by changing the points of contact, prevent degenerative changes in these parts.

As frequently happens in the use of a new method, some have gone to the other extreme and recommended an entire absence of splints and immobilization and entire reliance upon massage and motion. This is certainly wrong. The broken bone needs rest and this indication must be met by the use of splints and bandages, and a proper position. Of course, cases vary greatly, and good judgment must be used to give to each form of treatment its proper relative value.

H. P. DE FOREST.

SOKOLOFF ON FIBROMA ARBORESCENS OF THE JOINTS.[1]

RECENT opportunities for operative investigation have shown that papillomatous growths are a very common complication of chronic rheumatism. Formerly these extensive growths were thought to be extremely rare, and Schmolck, in writing upon the subject, could report but two cases occurring in von Volkmann's clinic. Since Schmolck's article appeared a few scattered cases have been reported, most of them being tubercular in character. Riedel even maintains that such papillomatous growths are the result of the slight irritation from old tubercular deposits. M. Schueller considers the papillomata to be the result of a chronic inflammatory irritation, and calls attention to the fact that they are present in various pathological conditions of the joints, *e.g.*, syphilis and arthritis deformans. Schueller's publication shows that papillomata appear but seldom in cases of rheumatism, and, although more frequently observed in arthritis deformans, the growths are either in the form of a single papilloma or appear as a circumscribed collection of papillomata arising from some part of the synovial membrane. Still more rarely are the growths found in tuberculosis. It must be concluded from the existing data that papillomata may be the outcome of a simple inflammatory irritation in various diseases, but that the variety to which Mueller has given the name "lipoma arborescens" is not frequent. The question why the presence of inflammatory irritation is not always characterized by the development of papillomata, appears for the present unanswerable. The object of the present article is to show that inflammatory irritation is not the sole cause for the development of these tumors.

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[1] N. A. Sokoloff, St. Petersburg: Sammlung klinische Vorträge, No. 81, September, 1893.

It has long been known that papillomata can occur upon a normal synovial membrane. In opposition to C. Hueter, who considers all papillomata as pathological growths, O. Hagen-Torn has demonstrated that they occur as entirely normal structures in both man and animals. M. Schueller shares completely this view, and adds, "that under normal conditions they are few in number, and are never so large that they can be felt from outside the joint." The growths are not scattered all over the synovial sac, but are usually found in certain places. They develop from the synovial membrane, and their structure remains identical with that of the membrane from which they arise. During the period of development the synovial coating becomes differentiated from the underlying tissue so that in some places it entirely disappears, in others it becomes thinner, and again forms papillomata. The disappearance of the synovial membrane occurs in those places where the pressure is greatest, as upon the surface of the cartilage; in places where the pressure is somewhat less the membrane merely becomes thinner; where, however, a negative pressure exists papillomata are found upon the membrane. Since under normal condition negative pressure can exist in but few places in the joint, papillomata can occur only in quite restricted localities. Aspiration, by increasing the negative pressure, markedly increases the number of tumor masses.

The papillomata, like the synovial membranes, are formed from connective tissue. They rest upon pedicles of varying thickness, and hang free in the joint cavity. They often divide and subdivide, and are then apt to be pyriform in shape. These last contain loops of blood-vessels, the more vascular forms containing fat cells in abundance, while those less freely supplied with blood often contain cartilage cells. The polyp cells are identical with those of the synovial membrane, though the ground substance in which the cells lie is usually more delicate in structure. A bundle of thicker connective tissue is frequently found lying as a sort of axis in the mass, and sometimes there are secondary and more delicate fascicles lying parallel with it.

In those joints where the intra-articular pressure is subject to wide variations, the conditions for polyp formation are especially favorable, negative pressure being the chief factor in their development. The less yielding parts of the joints, such as the cartilage and ligaments, together with such soft parts as are in frequent motion, are not affected by negative pressure, and hence show no papillomata. Where, however, the tissues are movable, and of a looser texture, absorption is easier, negative pressure easily occurs, and polyps are frequent. That friction (to which was formerly assigned an important rôle in the etiology of papillomata) is unimportant, is shown by the fact that these polyps develop only at those places where the rubbing during joint movements is at a minimum.

These facts are well illustrated by the following histories of two cases coming under the author's immediate observation :

CASE I.—A woman suffering from syringomyelia was treated for a diseased condition of the shoulder joint. The joint was opened and there escaped from the incision a mass of papillomata which originated from the lateral part of the capsule only—a part which, as the subsequent examination showed, was without function at the time.

After the humerus was drawn downward it was found that the joint cavity was greatly distended; the head of the humerus and the glenoid fossa had disappeared entirely, and the capsule was stretched and in some places markedly thickened. The inner surface of the lateral wall was completely covered with polyps varying in size from a millimetre to a centimetre in diameter. The remainder of the synovial membrane was smooth. For some time before the operation there had existed a dislocation of the shoulder inward and upward, which could easily be reduced, but which immediately recurred as soon as the arm was left to itself. The patient could move the arm to a limited extent, but to reduce the luxation herself by mere muscular contraction was impossible.

Microscopical examination showed the usual structure of hypertrophied papillomata, with the exception that so much fat was present that the name "lipoma arborescens" was entirely applicable, the masses appearing for the most part like true lipomata. The blood-vessels in the polypi were numerous and well developed.

It is to be noted that the growths occurred only on that portion of the capsule which had ceased to functionate, and which from the nature of the dislocation was subject to negative pressure.

CASE. II.—The patient, a man sixty-five years of age, died in the hospital at Moscow in 1888. Fifteen years before he had dislocated his right shoulder. It was reduced, but was again dislocated two years later, and this time remained unreduced. The patient was able to resume his work, and to move his shoulder slightly; after a time the shoulder became somewhat movable. He came to the hospital on account of œdema of the lower half of the body, and a swelling of the right shoulder and elbow. A fistula appeared near the elbow, from which a moderately turbid fluid escaped. A small fistula was also observed over the shoulder joint, but it was not possible to enter the joint with a probe. The elbow became ankylosed, but the shoulder, though badly deformed, remained movable. The patient was under observation for some time, but the cause and character of the swelling remained unexplained. He finally died suddenly.

Extreme pulmonary emphysema, complete obliteration of the pericardial sac, and extensive changes in the elbow and shoulder joint, were found post-mortem. In the elbow there had been an inflammatory process leading to ankylosis. The head of the radius was grown fast to the humerus; the ulna was also united to the humerus by firm fibrous bands. The capsule of the joint was thickened, and in places adherent to the bones.

The capsule of the shoulder joint was intact, but uniformly thickened. Upon opening the joint in front, the head of the humerus was found to be dislocated, and lying immediately beneath the acromial end of the clavicle. The head of the humerus had become somewhat egg-shaped, and was covered with turbid cartilage. The head was not found in the normal joint groove, which was completely covered with a fibrous scar tissue, and badly deformed as a result of the former rupture, but was in a new groove, more inward and above, and nearer to the acromial end of the clavicle. The broken-off end of the coracoid process, surrounded by a fibrous mass, lay behind this groove. This newly formed groove was surrounded by a soft fibrous mass, and about the middle of the end was a small ulcer, corresponding to a similar sized ulcer upon the altered cartilage, covering the end of the bone. In the posterior corner of the capsule behind and outward from the newly formed groove, and behind the head of the humerus, was a large conglomerate mass of polypi passing in part over the posterior section of the bone like a definitely formed wall, as far as the border of the cartilage. These papillomata were soft, showed nowhere cartilaginous or bony thickening, and were very variable as regards size and shape. A few single polyps were found here and there in the joint, but they were flat, compressed, and nowhere formed such a thick conglomerate of papillomata as in the angle behind the bone. A few polyps were even found upon the head of the humerus at the points of greatest turbidity and thickening of the cartilage.

Microscopically, the usual structure of hypertrophied polyps was found, with numerous blood-vessels. The amount of fat in the masses was insignificant, and cannot be compared with the first case mentioned.

In this case also, as a result of the long-standing unreduced dislocation of the humerus, a portion of the joint ceased to functionate; here, too, a negative pressure existed, and here there developed a mass of papillomata. That there existed a chronic inflammatory process, probably rheumatic in character, is rendered likely by the ankylosis of the elbow joint, and this could readily account for the scattered single papillomata in the shoulder joint; such single growths are sometimes found in completely normal joints—they have little significance.

This case, too, can only be explained by the existence of negative pressure in the joint. In both cases the polyp formation was sharply limited. In the first case the complete absence of any inflammatory irritation enables this factor in the etiology to be excluded. In the second case the inflammatory processes would have some consideration as an etiological factor did not the long duration of the process (nearly thirteen years) exclude them. If this be admitted as the cause, why did the growths limit themselves solely to that portion of the capsule whose function was lost? The time of progress of the disease was long enough to have covered the entire synovial surface with similar growths. The two cases show that, besides the inflammatory irritations in certain diseases, the variations in intra-articular pressure alone may act as the sole cause of such growths.

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